

WIRELINE JARS

Instruction Manual 8630



Hydraulic and Tubular Wireline Jars

One Company Unlimited Solutions

NOV NATIONAL OILWELL VARCO

Wireline Jars

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The designs and specifications for the tools described in this instruction manual were in effect at the time this manual was approved for printing. National Oilwell Varco, whose policy is one of continuous improvement, reserves the right to discontinue models at any time, or to change designs and specifications without notice or without incurring obligation.

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NATIONAL OILWELL VARCO

General Description

Bowen Hydraulic Wireline Jars provide the means for dependable, controlled jarring when required during wire line operations. A patented, closed hydraulic system, comparable to well known Bowen Hydraulic Rotary Jar system is employed in the Bowen Hydraulic Wireline Jar. This design permits the operator to control the intensity of the jarring blow within a broad range. The Bowen Hydraulic Wireline Jar can be made to deliver a very light blow, as would be required with measuring line, or a very heavy blow, as might be required with stranded wire lines.

Use

Bowen Hydraulic Wireline Jars may be used in any wire line operation that does not require electrical continuity to tools or instruments below the Jar. These operations include permanent well completion services, setting and pulling gas lift valves, chokes and other downhole retrievables tubing equipment and cable tool services such as swabbing, bailing and fishing.

Construction

The Bowen Hydraulic Wireline Jar consists of two separate assemblies. A Mandrel Assembly which includes the Top Sub, Mandrel with integral piston, Valve Plug Seal and a Valve Plug. The Middle Body Assembly consists of the Bottom Sub, Middle Body, Middle Body Insert and a Balance Piston. When completely assembled, the two principle assemblies are free to move in relationship to each other and movement is controlled by the hydraulic fluid. Bowen patented seal ring assemblies are used in the critical areas subjected to high internal pressures.

Explanation of Mechanism

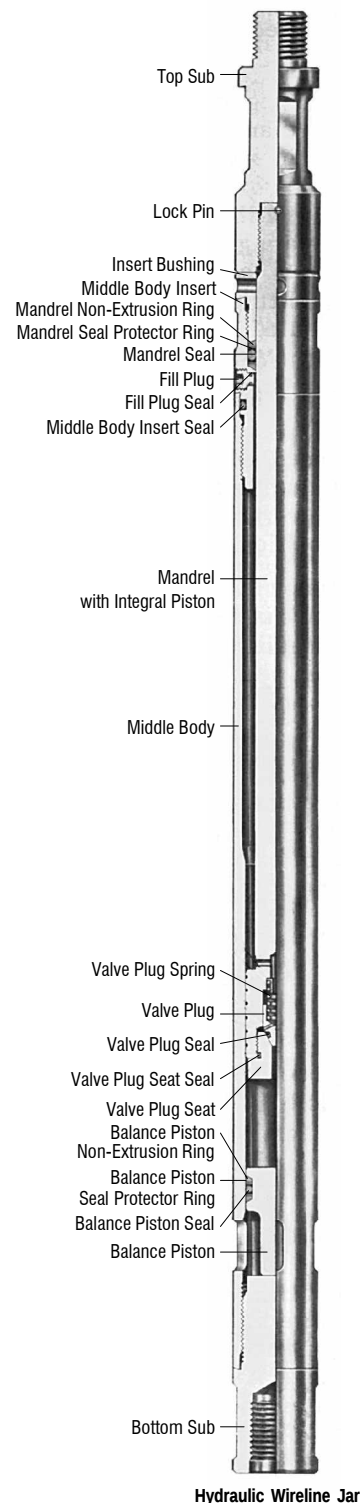
When the Bowen Hydraulic Wireline Jar is in the closed position, the integral piston which is part of the Mandrel unit rests within the restricted inside diameter portion of the Middle Body. When an upward strain is taken on the wire line, the Mandrel Assembly is pulled upward with respect to the Middle Body Assembly. Upward movement is impeded by the hydraulic fluid which must pass the extremely narrow annular passage between the integral piston of the Mandrel and the restricted inside diameter portion of the Middle Body.

As soon as the integral piston passes from the restricted inside diameter of the Middle Body into the enlarged inside diameter portion of the Middle Body, the fluid resistance ceases. The Mandrel Assembly will then travel upward at a constantly accelerating velocity until the shoulder on the integral piston strikes the Middle Body Insert transmitting an upward jarring blow to the tools installed below the Hydraulic Wireline Jar.

After the jarring blow has been struck, the wire line is slacked off to allow the Jar to close. While being closed, the Valve Plug is lifted away from the Valve Seat to permit a rapid transfer of the hydraulic fluid as the tool moves back into its closed position.

A Balance Piston located near the lower end of the Middle Body is free to move up and down as required to equalize the internal pressure of the tool with the well pressure. This Balance Piston also accommodates any expansion of the internal hydraulic fluid so that high internal pressures due to expansion will not occur.

The Top Sub has an appropriate fishing neck and wrench flats. It is pinned to the Mandrel at the connection to offer positive safety against backing off during operation.



Hydraulic Wireline Jar

The Middle Body Insert for the 1 1/8", 1 1/4" and 1 1/2" O.D. Jars are made in two pieces, a Middle Body Insert Bushing being required. This arrangement allows the Seal Assembly to be installed more easily than it would be in a one-piece assembly because of the small bore through the Insert. Middle Body Inserts for the 1 1/4" O.D. and larger Jars have large enough bores to allow a one-piece unit.

Operation

The Bowen Hydraulic Wireline Jar is made up in the wireline string immediately above the tools or equipment being run. It is recommended that several Bowen Sinker Bars, having an outside diameter corresponding to the Jar, be assembled above the tool. The weight of these Sinker Bars, will to a large extent, determine the intensity of the jarring blow and will also aid in closing the Jar with a minimum time lapse.

A Bowen Tubular Wireline Jar may be assembled in the string immediately above the Hydraulic Wireline Jar to provide a convenient means for bumping down. The combination of the two tools is particularly useful in assuring the operator of the ability to effectively jar both up and down, whichever may be required in his operations.

The assembled tools are run into the well in the usual manner and the fish or equipment is engaged.

An upward strain is taken on the wireline by reeling at the hoist until stretch has been taken in the wireline. The operator then sets the hoist brake and waits for the Jar to strike its blow.

After the jarring blow has been struck, the wire line is slacked off enough to allow the Jar to close. The jarring operation is then repeated by taking another strain on the wire line. The frequency of

blows struck may be as rapid as the hoist operator can reel in and slack off the line at the hoist.

To increase the intensity of the blow, a greater strain (more stretch) is taken on the wire line. To reduce the intensity, less strain is taken on the wire line. Bowen Hydraulic Wireline Jars and Bowen Tubular Wireline Jars are run in and out of the well on the wireline exactly like any other wire line tool. No special precautions or considerations are necessary, except that the zero point or depth measuring reference should take into account the length of the stroke of the Jar. The length of stroke of each standard Jar is listed on the specification on page 7. The stroke of the Jar may be checked by measuring the length of the Jar when both open and closed — the difference being the stroke.

Disassembly

Complete disassembly of the tool should proceed as follows:

1. Clamp the Jar in a suitable vise at the Middle Body.
2. Remove the Bottom Sub.
3. Set an open-mouthed container below the Middle Body Insert, then remove the Fill Plug, allowing the oil to drain from the Jar. Slide the Mandrel out slowly, forcing the oil out with the Piston.
4. Loosen and back out the Middle Body Insert from the Middle Body.
5. Withdraw the sub-assembly of the Top Sub, Mandrel and Middle Body Insert from the Middle Body. Lay it aside.
6. Remove the Balance Piston from the Middle Body by use of a wooden dowel or brass rod. Remove the Middle Body from the vise.

7. Secure the Top Sub/Mandrel Sub Assembly in the vise, clamping on the Top Sub.
8. Loosen and remove the Valve Plug Seat from the Piston. Remove the other valve parts: Valve Plug, and Valve Plug Spring.
9. Using a drift punch, remove the Lock Pin from the Top Sub. This Pin locks the Mandrel to the Top Sub to assure that it does not loosen and back off during operation.
10. Loosen and remove the Mandrel from the Top Sub.

CAUTION: Use a wrench only on the wrench flats provided. Any gouges or upsets on the finished Mandrel surface will cause loss of seals and leakage of fluid.

11. Slide the Middle Body Insert off the Mandrel. Clamp the Middle Body Insert in a vise and remove the Insert Bushing from it (where applicable).
12. Remove all O-Ring Seals from the Middle Body Insert, Bypass Valve and Balance Piston. Examine the Non-Extrusion Rings and Seal Protector Rings. If any show signs of wear or damage, remove them.

Reassembly

Thoroughly clean and dry all parts and apply them with a coat of light weight oil. Replace any damaged or badly worn parts.

1. To replace a seal assembly, insert the Non-Extrusion Ring (or rings) into the groove with the bevel of the Non-Extrusion Ring facing the matching bevel of the groove.
2. Insert the Seal Protector Ring (or rings) into the groove, against the flat face of the Non-Extrusion Ring, Press and straighten them in place with the thumbs.

3. Insert the O-Rings between the Seal Protector Rings.
4. After the Seal Assemblies have been positioned, set them in place by use of the appropriate Setting Tool.
5. Secure the Top Sub in a vise horizontally, clamping on the large O.D.
6. Screw the Insert Bushing into the Middle Body Insert, and carefully slide them over the threaded end of the Mandrel so that the seal will not be damaged in the process.
7. Screw the Mandrel into the Top Sub and tighten it, using the wrench flats provided.
8. Insert the Lock Pin into the Top Sub and through the Mandrel end. Drive it in with a light hammer until it is flush with the Top Sub O.D.
9. Install the Check Valve Assembly into the Piston end of the Mandrel; the Spring Guide in the Spring, the Valve Plug with its Seal in place and the Valve Plug Seat with its Seal in place.
10. Re-clamp the tool, clamping on the O.D. of the Middle Body Insert Bushing. Tighten the Middle Body Insert on the Insert Bushing.
11. Slide the Middle Body over the Mandrel. Be sure the slotted end of the Middle Body is toward the lower end.
12. Re-clamp the assembly vertically in the vise, with the Top Sub down and the Mandrel pulled out (with the Jar open).

13. Fill the Jar with approved ISO grade 22 hydraulic oil. If this is not available, use a high quality non-foaming SAE 20W oil. If this is used and an increased Jar strike time is desired, use SAE 30W or a mixture with 20W. If a decreased Jar strike time is desired, use SAE 10W or a mixture with 20W.
14. Insert the Balance Piston in the Middle Body with the stinger end toward the Bottom Sub.
15. Screw the Bottom Sub into the Middle Body, hand tight.
16. Clamp the assembly in the vise horizontally, with the Fill Plug upward. Remove the Fill Plug. Tighten the Bottom Sub.
17. Close the Jar very slowly. When it is completely closed, insert and tighten the Fill Plug until snug. Avoid over-tightening this Fill Plug.

Testing

The Jar can best be tested for operation by making up a lifting type sub with a bail (or equivalent) to the Top Sub. Make up another sub to the Bottom Sub to which an 850 lb. weight can be attached.

Obtain a dead weight of approximately 850 lbs. The usual method is to hang the Jar on a 2,000 lb. minimum capacity hoist, with the weight suspended from the Bottom Sub of the Jar. The hoist is slacked off until the weight rests on the floor and the Jar closes. The Jar and weight are then hoisted rapidly until the weight is raised off the floor by a height equal to the stroke of the Jar, less 1 or 2 inches. As soon as the load is lifted, begin checking the time required for the Jar to stroke open.

The chart below lists approximate time lapse for standard Wireline Jars, under a fixed pull load.

Hydraulic Wireline Jar Load and Time Recommendations

Jar O.D.	Load in lbs	Time Required to Stroke
1-1/8	850	30 sec to 1 min
1-1/4	850	45 sec to 1-1/2 min
1-1/2	850	1 min to 2 min
1-3/4	850	1-1/2 min to 2-1/2 min
2-1/8	850	2 min to 3 min

CAUTION: This method should not be employed using a hoist of less than 1 ton (2,000 lb.) capacity, as there is danger of damage to the hoist or injury to operating personnel if the hoist is too light.

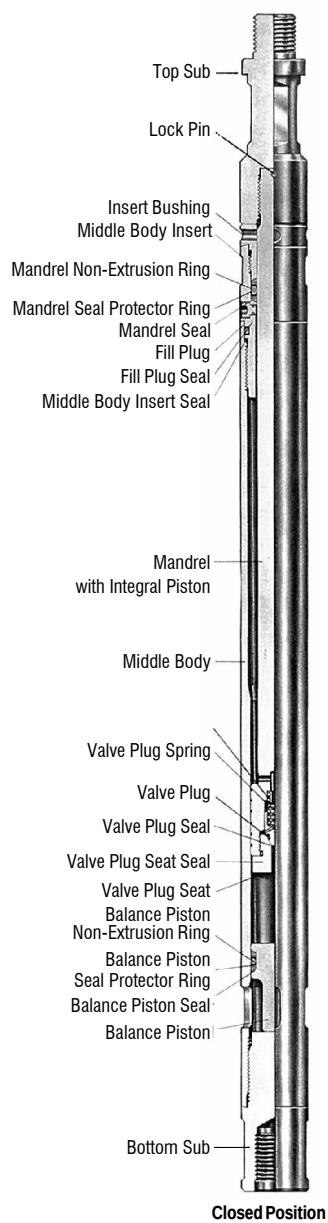
If leaks are detected at the seals, or if the Jar is low on fluid, the tool should be disassembled for repair.

Bowen Hydraulic Wireline Jars
Strength Data and Recommended Tightening Torque

Tool Assembly Part Number	O.D.	Tightening Torque (ft-lbs)				Strength Data	
		Top Sub to Mandrel	Insert Bushing to Middle Body Insert	Middle Body Insert to Middle Body	Middle Body to Bottom Sub	Maximum Allowable Load Jarring (lbs)	Tensile @ Yield After Jarring (lbs)
35097	1-1/8	40	80	90	130	5,300	22,000
11740	1-1/4	35	80	160	190	6,500	22,000
11180	1-1/2	75	180	210	300	9,200	37,500
48383	1-1/2	75	180	210	300	9,200	37,500
51227	1-1/2	75	180	210	300	9,200	37,500
35518	1-1/2	75	180	210	300	9,200	37,500
79297	1-3/4	135	230	390	440	15,500	54,500
11550	2-1/8	325	—	690	800	21,000	92,500

The above makeup torques are the maximum recommended makeup torques for each connection and are set at 50% of the calculated theoretical yield torque.

The above tensile strength is a calculate theoretical yield point and is considered accurate to ±20%.



Bowen Hydraulic Wireline Jars

Outside Diameter – Inches		1-1/8	1-1/4	1-1/2	1-1/2	1-1/2	1-1/2	1-3/4	2-1/8
Connections:		5/8 -	15/16 -	15/16 -	15/16 -	15/16 -	15/16 -	3/4	7/8
Pin Up – Box Down		11 Thd.	10 Thd.	10 Thd.	10 Thd.	10 Thd.	10 Thd.	S.R.	S.R.
Length of Stroke – Inches		6-3/4	9-1/4	8-3/4	8-3/4	20	12	10	11-5/8
Complete Assembly	Part No.	35097	11740	11180	48383*	51227	35518*	79297	11550
	Weight	10	10	11	11	12	13	20	30

Replacement Parts

Top Sub	Part No.	35098	11741	10761	10761	10761	10761	12761	11543
	Weight	1-1/4	1-1/4	1-1/2	1-1/2	1-1/2	1-1/2	3	4
Middle Body	Part No.	35099	11744	11182	11182	51228	35519	12765	11537
	Weight	3-3/4	3-3/4	4	4	5	5	7	10-1/2
Middle Body Insert	Part No.	35100	29486	28652	28652	28652	28652	79298	11538
	Weight	1	1	1	1	1	1	2	3
Insert Bushing	Part No.	35101	33572	33571	35085	33571	35085	79299	—
	Weight	1/4	1/4	1/4	1/2	1/2	1/2	1/2	—
Mandrel	Part No.	35102	11742	11184	35086	51229	35520	79300	11539
	Weight	2	2	2	2	3	3	3-1/2	5-1/2
Bottom Sub	Part No.	35103	11747	11181	11181	11181	11181	12767	11536
	Weight	1	1	1-1/4	1-1/4	1-1/4	1-1/4	2-1/4	3-1/2
Balance Piston	Part No.	35104	11746	11185	11185	11185	11185	12766	11540
	Weight	1/4	1/4	1/4	1/4	1/4	1/4	1/2	1/2
Valve Plug	Part No.	11189	11189	11189	11189	11189	11189	11189	11189
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Valve Plug Spring	Part No.	834	834	834	834	834	834	834	834
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Valve Plug Seat	Part No.	11745	11745	11186	11186	11186	11186	11186	11186
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Fill Plug	Part No.	39941	617	617	617	617	617	617	329
	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Lock Pin	Part No.	15136	16010	13432	13432	13432	13432	18183	42732
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/8	1/8
Mandrel Non-Extrusion Ring (2 Req'd.)	Part No.	365-11	365-11	365-15	365-15	365-15	365-15	365-17	365-21
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/16	1/16
Mandrel Seal Protector Ring (2 Req'd.)	Part No.	375-11	375-11	375-15	375-15	375-15	375-15	375-17	375-21
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/16	1/16
Balance Piston Non-Extrusion Ring (2 Req'd.)	Part No.	366-11	11750	366-16	366-16	366-16	366-16	366-20	366-24
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/16	1/16
Balance Piston Seal Protector Ring (2 Req'd.)	Part No.	82-11	82-11	82-16	82-16	82-16	82-16	82-20	82-24
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/16	1/16

* With fishing neck on insert bushing

How to Order

Specify:

- (1) Name and number of assembly or part
- (2) Connections, if other than standard

RECOMMENDED SPARE PARTS:

- (1) Balance Piston
- (2) 2 Valve Rings
- (3) 4 Valve Plug Springs
- (4) 2 Valve Plug Seats
- (5) 3 Mandrel Non-Extrusion Rings
- (6) 3 Mandrel Seal Protector Rings
- (7) 4 Balance Piston Non-Extrusion Rings
- (8) 4 Balance Piston Seal Protector Rings
- (9) 6 Complete Packing Sets
- (10) Jar Lube

Bowen Hydraulic Wireline Jars (Continued)

Complete Assembly	Part No.	35097	11740	11180	48383	51227	35518*	79297	11550
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Replacement Parts (Continued)

Complete Packing Set	Part No.	35106	11754	11191	11191	11191	11191	79327	11553
Consisting of:	Weight	1/8	1/8	1/8	1/8	1/8	1/8	1/8	1/8
Mandrel Seal	Part No.	568113	568113	568210	568210	568210	568210	568212	568216 (2 req'd)
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/16	1/16
Balance Piston Seal	Part No.	568113	568113	568211	568211	568211	568211	568215	568219 (2 req'd)
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/16
Middle Body Insert Seal	Part No.	568116	568116	568215	568215	568215	568215	568218	568221
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32
Middle Body Seal (Large)	Part No.	—	—	—	—	—	—	—	568223
	Weight	—	—	—	—	—	—	—	1/16
Valve Plug Seal	Part No.	568007	568007	568007	568007	568007	568007	568007	568007
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32
Valve Plug Seat Seal	Part No.	568110	568110	568112	568112	568112	568112	568112	568112
	Weight	1/32	1/32	1/32	1/32	1/32	1/32	1/32	1/32
Fill Plug Seal	Part No.	—	568005	568005	568005	568005	568005	568005	568006
	Weight	—	1/32	1/32	1/32	1/32	1/32	1/32	1/32

Accessories

Service Kit	Part No.	35105	11751	11178	11178	11178	11178	15997	11554
	Weight	2	2	2-1/2	2-1/2	2-1/2	2-1/2	3	3-1/2
Mandrel Body Setting Tool	Part No.	22709-11	22709-11	22709-15	22709-15	22709-15	22709-15	22709-17	22709-21
	Weight	1/2	1/2	1	1	1	1	1/4	1-1/2
Balance Piston Setting Tool	Part No.	22729-11	11753	22729-16	22729-16	22729-16	22729-16	22729-20	22729-24
	Weight	5/8	5/8	7/8	7/8	7/8	7/8	1	1-1/2
High-Temp Packing Set	Part No.	35107	34761	34760	34760	34760	34760	34762	34763
	Weight	1/4	1/4	1/4	1/4	1/4	1/4	1/4	3/8
Bowen Jar Lube	Part No.	49842**	49842**	49842**	49842**	49842**	49842**	49842**	49842**
	Pints Req'd.	1/2	3/4	3/4	3/4	1-1/2	1	3/4	3/4

Extra for All Sizes of Tools

Bowen Jar Lube JL-519**	Part No.	49842-A	1 Gallon
	Weight	8-1/2	
	Part No.	49842-B	5 Gallons
	Weight	40	
	Part No.	49842-C	20 Gallons
	Weight	248	
	Part No.	49842-D	55 Gallons
	Weight	455	
Rotary Transfer Pump	Part No.	50367	
	Weight	20	
Barrel Faucet	Part No.	50366	
	Weight	2	

How to Order

Specify:

- (1) Name and number of assembly or part
- (2) Connections, if other than standard

RECOMMENDED SPARE PARTS:

- (1) 1 Balance Piston
- (2) 4 Valve Plug Springs
- (3) 2 Valve Plug Seat
- (4) 3 Mandrel Non-Extrusion Rings
- (5) Mandrel Seal Protector Rings
- (6) 4 Balance Piston Non-Extrusion Rings
- (7) 4 Balance Piston Seal Protector Rings
- (8) 6 Complete Packing Sets
- (9) Jar Lube

General Description

The **Bowen Tubular Wireline Jar** is designed for use with the Bowen Hydraulic Wireline Jar or as a separate tool by itself.

The Bowen Tubular Wireline Jar is a straight-pull actuated jar with no restricted stroke. It is simple, rugged, and inexpensive.

Use

As stated above, the Tubular Jar may be used alone or in combination with the Bowen Hydraulic Wireline Jar.

The combination of the tools is particularly useful in permanent well completion operations to positively assure the ability to jar both ways as an aid in pulling, fishing, or gas lift operations.

Upward jarring with this combination is done in the usual manner with the Bowen Hydraulic Wireline Jar.

Construction

Bowen Tubular Wireline Jars are composed of a Top Sub, Link Body, Mandrel, and Bottom Sub. The full stroke will be either 20 inches or 30 inches.

The Link Body is perforated to eliminate fluid cushioning and mudpacking while in service. The Mandrel has an integral knocker at its upper end. At the end of up-stroke in use, the knocker strikes the lower end of the Link Body, producing impact. The Link Body bottoms against the Bottom Sub when it closes on the down-stroke.

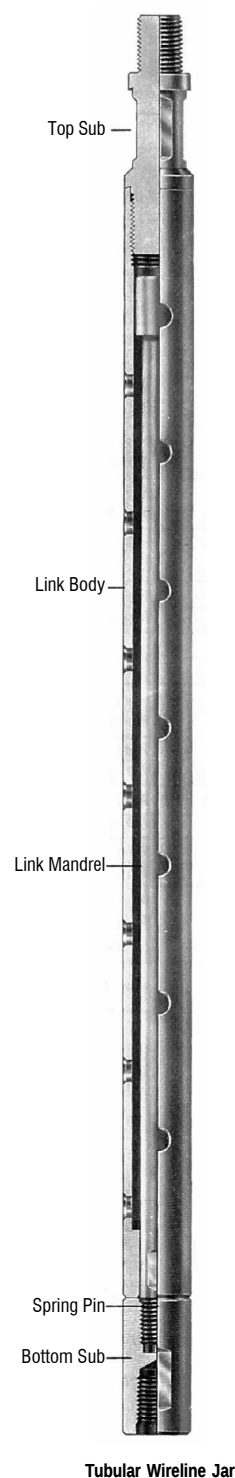
Operation

To jar down, the Bowen Tubular Jar is actuated either manually or by the use of a reel. The Jar is put into position by pulling or reeling in. A sudden release or rapid unreeling causes the weight of the Jar and Sinker bars to close the Jar. The downward blow is delivered sharply when the Jar Body strikes the Bottom Sub.

Maintenance

Since the Bowen Tubular Wireline Jar is very simple, maintenance is confined primarily to cleaning after use.

After each job, the Jar should be completely disassembled, cleaned, and reassembled. Thread dope should be applied to the threaded joints and the mandrel coated with grease or heavy lubricating oil at reassembly. The exterior of the tool may be painted or greased before storage.



Tubular Wireline Jar

Bowen Tubular Wireline Jars

Outside Diameter	1 or 1-1/8	1-1/4	1-1/4	1-1/2	1-1/2	1-3/4	1-3/4	1-7/8	1-7/8	2-1/8	2-1/8	
Connections	5/8	15/16	15/16	15/16	15/16	3/4	3/4	3/4	3/4	7/8	7/8	
Top-pin Bottom-box	11 Thd.	10 Thd.	10 Thd.	10 Thd.	10 Thd.	S.R.	S.R.	S.R.	S.R.	S.R.	S.R.	
Length of Stroke	18	20	30	20	30	20	30	20	30	20	30	
Complete Assembly	Part No.	19355	12350	12350	10689	10689	14235	14235	21430	21430	11551	11551
	Weight	13	14	20	16-1/4	20-1/4	24	32-1/2	30	40	35-1/2	47-1/2

Replacement Parts

Top Sub	Part No.	19356	12351	12351	10677	10677	14236	14236	21431	21431	11547	11547
	Weight	1	1-1/4	1-1/4	1-1/2	1-1/2	2-1/2	2-1/2	3	3	4	4
Body	Part No.	19357	12352	12352	10758	10758	14237	14237	21432	21432	11544	11544
	Weight	5	5	7	5-1/2	7-1/2	8	11-1/2	9	13	11	16
Mandrel	Part No.	19358	12368	12368	10924	10924	14232	14232	14232	14232	11531	11531
	Weight	6	7-1/2	10-1/2	8-1/4	11-1/4	12	17	12	17	17	24
Bottom Sub	Part No.	19359	12356	12356	10678	10678	14233	14233	21433	21433	10732	10732
	Weight	1	1	1	1	1	1-1/2	1-1/2	3	3	3-1/2	3-1/2
Spring Pin	Part No.	13431	A-13568	A-13568	15143	15143	27220	27220	18183	18183	25499	25499
	Weight	1/16	1/16	1/16	1/16	1/16	1/16	1/16	1/8	1/8	1/8	1/8

Miscellaneous O-Ring seals are normally furnished in sealed plastic bags of 10, 25, or 100 pieces each to prevent deterioration. Other quantities will be furnished in unsealed packages. Packing sets, however, will always be furnished in sealed plastic bags.

How to Order

Specify:

- (1) Name and number of assembly or part
- (2) Top and bottom connections
- (3) Length of stroke

Corporate Headquarters

10000 Richmond Avenue
Houston, Texas 77042
United States
Phone: 713 346 7500
Fax: 713 346 4493

Alaska

4111 Ingra
Anchorage, Alaska 99503
United States
Phone: 907 563 5253
Fax: 907 561 0071

California

4117 Atlas Court
Bakersfield, California 99308
United States
Phone: 661 395 0165
Fax: 661 328 1827

Louisiana

108 Nova Drive
Broussard, Louisiana 70518
United States
Phone: 337 839 2400
Fax: 337 839 2211

190 Thompson Road
Houma, Louisiana 70363
United States
Phone: 985 851 1111
Fax: 985 851 1117

Mississippi

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United States
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Fax: 601 649 8673

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Texas

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Houston, Texas 77022
United States
Phone: 713 691 7800
Fax: 713 691 7807

2810 Highway 135 North
Kilgore, Texas 75662
United States
Phone: 903 984 2553
Fax: 903 984 7170

10720 West I-20 East
Odessa, Texas 79765
United States
Phone: 432 563 1173
Fax: 432 563 1182

30444 Southwest Freeway
Rosenberg, Texas 77471
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Phone: 281 341 5365
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Vernal, Utah 84078
United States
Phone: 435 789 0670
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Clarksburg, West Virginia 26301
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Canada

9120 – 34A Avenue
Edmonton, Alberta T6E 5P4
Canada
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Fax: 780 463 2348

3550 93 Street*
Edmonton, Alberta T6E 5N3
Canada
Phone: 780 944 3929
Fax: 780 430 0760

1100 540 5th Avenue SW (Mailing)
1010 540 5th Avenue SW (Office)
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* Denotes Manufacturing and Engineering facilities

Downhole Solutions

Drilling Solutions

Engineering and Project Management Solutions

Lifting and Handling Solutions

Production Solutions

Supply Chain Solutions

Tubular and Corrosion Control Solutions

Well Service and Completion Solutions